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T.M.

Docket No.: 60,130-1123

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Catania	
Serial Number:	09/892,163	Examiner: Burch, Melody M.
Filed:	6/26/2001	Group Art Unit: 3683
Title:	"Brake Shoe Retainer Clip"	
Docket No.	60,130-1123	

BOX AF
Assistant Commissioner of Patents
Washington, D.C. 20231

APPEAL BRIEF

Dear Sir:

Subsequent to the filing of the Notice of Appeal on February 12, 2003, Appellant hereby submits its brief. Enclosed is a check for the appeal brief fee. Any additional fees or credits may be charged or applied to Deposit Account No. 50-1482 in the name of Carlson, Gaskey & Olds.

Real Party in Interest

The real party in interest is Meritor Heavy Vehicle Technology, LLC, the assignee of the entire right and interest in this Application.

Related Appeals and Interferences

There are no related appeals or interferences.

Status of Claims

Claims 4, 6, and 9-21 are pending in the application including independent claims 4, 6, 9, 16, and 17. Claims 1-3, 5, 7, and 8 have been cancelled. All 35 U.S.C. 112 rejections have been overcome.

Claims 4, 9-15, and 17-21 stand finally rejected under 35 U.S.C. 102(b). Claims 6 and 16 have been allowed.

Status of the Amendments

The amendments of January 13, 2003 and the January 31, 2003 have not been entered. All other amendments have been entered.

Summary of the Invention

A brake shoe assembly includes a retaining clip that interacts with an anchor pin to maintain shoe contact, provide proper shoe orientation, and prevent shoe drag when the brake assembly is not applied. See Paragraph [1].

Figure 1 is a side view of a drum brake system 10. The drum brake system 10 includes a cylindrical brake drum 12, a first brake shoe assembly generally shown at 14, a second brake shoe assembly generally shown at 16, and an actuator 18. The first and second brake shoe assemblies 14 and 16 are preferably identical such that a description of the first brake shoe assembly 14 or its components is also applicable to the second brake shoe assembly 16. The actuator 18, shown schematically in Figure 1, is an s-cam mechanism that is rotated during a brake actuation causing the brake shoes 14, 16 to engage the drum 12. See Paragraph [17].

The brake drum 12, which rotates about an axis of rotation 20, has an inner surface 22 and an outer surface 24. The first and second brake shoe assemblies 14 and 16, located adjacent to the inner surface 22 of the brake drum 12, include a brake lining 26 having a predetermined thickness. The brake linings 26 are comprised of a known friction material attached to a backing plate 28. Each brake lining

26 presents a wear surface 32, which contacts the inner surface 22 of the rotating brake drum 12 and wears further and further away each time the actuator 18 moves the first and second brake shoe assemblies 14 and 16 against the brake drum 12. See Paragraph [18].

Each brake shoe 14, 16 is pivotally mounted at one end 34 to a brake spider 36 with an anchor pin 38. The anchor pin ends 34 of the brake shoes 14, 16 are opposite from actuation ends 40 of the brake shoes 14, 16. The anchor pin 38 for the first brake shoe 14 defines a first pivot axis 42 and the anchor pin 38 for the second brake shoe 16 defines a second pivot axis 44. When the brakes are applied, the actuator 18 pivots the shoes 14, 16 about the first 42 and second 44 pivot axes, respectively. See Paragraph [19].

A prior art cam brake assembly is shown in Figure 2. This assembly includes a return spring 46 that returns the brake shoes 14, 16 to their original position after each brake actuation. The brake assembly also includes a pair of retainer springs 48 (only one set is shown) for each brake shoe 14, 16 mounted on the anchor pin end . The retainer springs 48 maintain the shoe contact and orientation with the anchor pin 38 and prevent the shoes 14, 16 from dragging when the brake is not applied. See Paragraph [20].

These retaining springs 48 are extension springs that are designed such that in the installed condition the spring is in a slight extension that results in a sufficient load to retain the weight of the shoe relative to the anchor pin 38. The use of this type of spring is disadvantageous and can lead to early failure. Coil clashing caused by normal road vibration can result in early fatigue failure. The spring manufacturing process can introduce a tool marks on the spring resulting stress concentrations, which can lead to premature failure. See Paragraph [21].

Thus, the subject invention includes a retainer clip 50, shown in Figure 3, which eliminates the need for retaining springs 48. The retaining clip 50 preferably includes a base portion 52 with a pair of transversely extending legs 54 positioned on opposite sides of the base portion 52. Each leg 54 preferably has a hooked end 56 that engages the anchor pin 38. It should be understood that there is one retaining clip 50 for each brake shoe 14, 16. Thus, the retaining clip 50 shown in Figure 3 is the same for each brake shoe 14, 16. See Paragraph [22].

The anchor pin 38 includes a cylindrical body 58 and a pair of pin ends 60 positioned on opposite sides of the body 58 to define the pivot axis 42. The pin ends 60 have a significantly smaller diameter than the body 58. The hooked ends 56 of the clip 50 engage the pin ends 60 to maintain the proper shoe geometry. See Paragraph [23].

The clip 50 is mounted to the backing plate 28 with a resilient tab 62. The tab 62 includes at least one grip 64 to engage the backing plate 28. Preferably the grip 64 is a pointed tooth member that clips onto the plate 28 such that the tab 62 is on one side of the plate 28 with the remaining portions of the base 52 being positioned on the opposite side of the plate 28. See Paragraph [24].

The clip 50 can be attached to the plate 28, as shown in Figure 3, or can be attached to another portion of the shoe 14, as shown in Figure 4. Each brake shoe 14 includes a pair of transversely extending webbed flanges 70 that extend inwardly toward the center of the brake assembly. The webbed flanges 70 define an engagement surface 72 that receives a portion of the body 58 of the anchor pin 28. In the alternate embodiment of Figure 4, the clip 50 is shown attached to the flanges 70. The clip 50 can be attached to one or both of the flanges 70. See Paragraph [25].

When the cam 18 is applied, the shoes 14, 16, the clips 50, and the anchor pins 38 pivot as a unit about their respective axes 42, 44. The return spring 46 is used to return the shoes 14, 16 to their original position and the retaining clips 50 cooperate with the anchor pins 38 to maintain proper shoe contact and orientation. See Paragraph [26].

The subject invention provides a brake shoe retaining clip 50 that eliminates the need for retaining springs 48. The retaining clip 50 provides a more robust design and has increased fatigue life over prior art systems. See Paragraph [27].

Issues

Is the final rejection of claims 18 and 19 under 35 U.S.C. 102(b) proper over the reference of EP 0044377?

Is the final rejection of claims 4, 9-15, and 17-21 under 35 U.S.C. 102(b) proper over the reference of U.S. Patent No. 4,503,953 to Majewski?

Grouping of Claims

A. The rejection of independent claims 4 and 17 and associated dependent claims 18-21 is contested.

B. The rejection of independent claim 9 and associated dependent claims 10-12 is separately contested, i.e. claims 9-12 do not stand or fall with claims 4 and 17.

C. The rejection of claims 13 and 14 is separately contested, i.e. claims 13 and 14 do not stand or fall with claim 11.

D. The rejection of claim 15 is separately contested, i.e. claim 15 does not stand or fall with claim 11.

Patentability Arguments

A. Claims 4 and 17-21

Claims 4 and 17-21 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,503,953 to Majewski. Claim 4 includes an anchor pin pivotally mounting one end of the mounting member to the brake spider with the anchor pin including a cylindrical body with a pair of pin ends extending in opposite directions from the body to define a pivot axis in combination with a retainer clip attached to the mounting member and cooperating with both of the pin ends wherein the retainer clip, the anchor pin, and the mounting member are all rotated about the pivot axis during brake actuation.

Majewski clearly does not teach this combination of features. The examiner argues that Majewski teaches a mounting member 31, 32, an anchor pin 20, 22, and a retainer clip 40. As clearly shown in the Figures and described in the text of the Majewski reference, the anchor pins are indicated at 15 and are not component 20, 22. Component 20 is a cam follower that cooperates with brake actuator cam 19 and is positioned at an end of the brake shoe opposite from that of the anchor pin 15. "A cam 19 is mounted for rotary movement between the adjacent ends of the brake shoes 14 opposite from the anchor pins 15. The brake shoes 14 are each provided with a roller-type cam follower 20." See column 2, lines 46-50.

The Majewski reference does not disclose a retainer clip that cooperates with the anchor pin. Instead, Majewski teaches the use of a retaining spring 17 that cooperates with both brake shoes 14 at the brake shoe end where the anchor pins 15 are mounted. This retaining spring 17 operates in a manner similar to that shown in prior art Figure 2 of the subject application and described in the accompanying specification at paragraphs [20] and [21]. The component that the examiner argues is the retainer clip, i.e. roller retainer 40, is mounted at a brake shoe end opposite from the end at which the anchor pins 15 are mounted. Thus, Majewski does not teach a brake assembly where the retainer clip, the anchor pin, and the mounting member are all rotated about the pivot axis during brake actuation as defined by Appellant in claim 4.

Further, while it is well settled that terms in a claim are to be given their broadest reasonable interpretation, this interpretation must be consistent with the specification, with claim language being read in light of the specification as it would be interpreted by one of ordinary skill in the art. The examiner argues that cam rollers 20 are equivalent to an anchor pin. Specifically, the "examiner has interpreted the cam follower portion of cylindrical body 20 as the means by which the pivotal movement is outlined and the pivoting axis is defined." This directly contradicts the claim language.

Claim 4 clearly states that the anchor pin pivotally mounts the mounting member to the brake spider and defines the pivot axis. As shown in the Figures and as described in the accompanying subject specification, Appellant's anchor pins 42, 44 are positioned at opposite ends of the brake shoes from the cam actuator 18. One of ordinary skill in the art would not consider element "20" in Majewski to be an anchor pin corresponding to the claimed anchor pin as set forth in claim 4, especially since the Majewski reference repeatedly refers to element "15" as the anchor pin. The cam rollers 20 also do not "anchor" the brake shoes. The cam rollers 20 move outwardly with the shoe during a brake actuation. The only member that serves to anchor the brake shoes are the anchor pins themselves, which are clearly described and identified as element 15, not element 20. Further, under the examiner's interpretation, Majewski cannot pivot about the anchor pin axes as defined in claim 4 because the examiner's anchor pins 20 are at the same end of the brake shoe as the actuator 19. Thus, Majewski does not anticipate claim 4 and Appellant respectfully requests that the rejection be withdrawn. For similar reasons Majewski does not anticipate claim 17-21.

Claims 18 and 19 stand rejected under 35 U.S.C. 102(b) as being anticipated by EP 0044377. Claim 18 is dependent from claim 17. EP 0044377 does not anticipate claim 17, thus, EP 0044377 cannot anticipate claim 18 and 19. The rejection is improper and Appellant respectfully requests that the rejection be withdrawn.

B. Claims 9-12

Claims 9-12 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,503,953 to Majewski. Claim 9 includes a first anchor pin pivotally attaching one end of the first brake shoe to the first mounting portion to define a first pivot axis, a second anchor pin pivotally attaching one end of the second brake shoe to the second mounting portion to define a second pivot axis, an actuator for pivoting opposite ends of the first and second brake shoes about the first and

second pivot axes, respectively, during a brake actuation, a first retainer clip cooperating with the first anchor pin to maintain proper contact and orientation between the first anchor pin and the first brake shoe, and a second retainer clip cooperating with the second anchor pin to maintain proper contact and orientation between the second anchor pin and the second brake shoe.

The examiner argues that Majewski teaches first and second anchor pins 20, first and second retainer clips 40, and an actuator 19, and further argues that the actuator 19 pivots opposite ends of the first and second brake shoes about the first and second pivot axes defined by the anchor pins. Under the examiner's interpretation of Majewski, the clips 40, anchor pins 20, and actuator 19 are all positioned at the same end of the brake shoes. Thus, the actuator 19 cannot pivot opposite ends of the brake shoes about the anchor pin pivot axes as claimed by Appellant.

The examiner further has interpreted "opposite ends" as "being the oppositely facing ends of the brake shoes shown in the area of the respective element number 20 as shown on the brake shoes in figure 1." The examiner also argues that Appellant's "argument that the 'opposite ends' of the instant invention are intended to represent opposite ends of the brake shoes from the cam actuator is more specific than the claim language." First, the examiner's interpretation of "opposite ends" of the brake shoes clearly does not make any sense in light of the claim language. Claim 9 clearly states that the first and second anchor pins pivotally attach one end of the respective brake shoe to the mounting portion to define first and second pivot axes, respectively. Claim 9 further states that the actuator pivots opposite ends of the first and second brake shoes about the first and second pivot axes, respectively, during a brake actuation.

Under the examiner's interpretation, the anchor pins 20 (cam roller) and the actuator 19 (cam) are all at the same end of the brake shoes. The examiner's interpretation that the opposite ends are opposite facing ends near element 20 directly contradicts the claim language. The examiner's interpretation must be consistent with the specification, with claim language being read in light of

the specification as it would be interpreted by one of ordinary skill in the art. The definition of "opposite ends" of the brake shoes is clearly defined in Appellant's description and the accompanying drawings. "Each brake shoe 14, 16 is pivotally mounted at one end 34 to a brake spider 36 with an anchor pin 38. The anchor pins ends 34 of brake shoes 14, 16 are opposite from actuation ends 40 of the brake shoes 14, 16." See paragraph [19]. One of ordinary skill in the art would not consider opposite ends in Majewski as positioned at the cam end of the brake shoe, as argued by the examiner, to correspond to the claimed anchor pin ends as set forth in claim 9. Further, under the examiner's interpretation, Majewski cannot pivot the "opposite ends" of the brake shoes about the first and second pivot axes as defined in claim 9 because the examiner's anchor pins 20 are at the same end of the brake shoe as the actuator 19.

Thus, for these reasons, in addition to the reasons discussed above with regard to claims 4 and 17 in Section A, Majewski cannot anticipate claims 9-12 under 35 U.S.C. 102(b) and Appellant respectfully requests that the rejection be withdrawn.

C. Claims 13 and 14

Claims 13 and 14 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,503,953 to Majewski. Claim 13 includes the feature of each of the anchor pins having a cylindrical body and a pair of pin ends of smaller diameter than the body extending outwardly from opposing ends of the body and wherein an exterior surface of the body contacts the engagement surfaces of the webbed flanges.

For the reasons discussed above in Sections A and B, elements 20 of Majewski cannot be interpreted to be the anchor pins as defined by Appellant. Even if elements 20 can be interpreted as anchor pins, Majewski does not teach the features set forth in claim 13. Claim 13 requires that the webbed flanges contact the body portion of the anchor pin, which is greater in diameter than the pin

ends. As clearly shown in Figure 3 of Majewski, the webbed flanges 31 contact the pin ends 22 of the cam roller 20, and not the body portion. Thus, Majewski cannot anticipate claims 13-14 and Appellant respectfully requests that the rejection be withdrawn.

D. Claim 15

Claim 15 stands rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,503,953 to Majewski. Claim 15 includes the feature of the first retainer clip, the first brake shoe, and the first anchor pin all pivoting about the first pivot axis during a brake actuation and the second retainer clip, the second brake shoe, and the second anchor pin all pivoting about the second pivot axis during a brake actuation.

For the reasons discussed above in Sections A and B, elements 20 of Majewski cannot be interpreted to be the anchor pins as defined by Appellant. Even if elements 20 can be interpreted as anchor pins, Majewski does not teach the features set forth in claim 15. The retainer clip, brake shoe, and associated anchor pin do not all pivot about the same pivot axis as defined in claim 15. As set forth in claim 9, the anchor pins define the pivot axis. If element 20 is interpreted as the anchor pin, then the "anchor pin" does not define the pivot axis. Instead, element 15 defines the pivot axis. Element 20 does not "anchor" the brake shoe, element 15 anchors the brake shoe, i.e., element 15 fixes the end of the brake shoe to the spider 11 to allow only pivotal movement. In order for the brake shoe to be brought into engagement with the brake drum to perform a braking operation, the cam rollers 20 must move outwardly, away from each other, with their respective brake shoe. Thus, it is impossible for the clip, shoe, and anchor pin elements, as defined by the examiner, to pivot about a pivot axis defined by element 20.

Thus, Majewski cannot anticipate claim 15 and Appellant respectfully requests that the rejection be withdrawn.

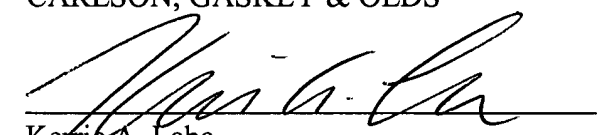
Closing

For the reasons set forth above, the rejection of all claims is improper and should be reversed.

Appellant earnestly requests such an action.

Respectfully submitted,

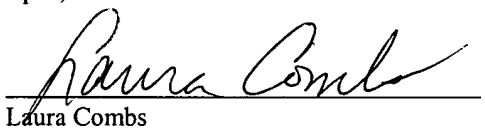
CARLSON, GASKEY & OLDS



Kerrie A. Laba
Attorneys for Appellant
Registration No. 42,777
400 W. Maple Rd., Ste. 350
Dated: April 11, 2003 Birmingham, MI 48009

CERTIFICATE OF MAILING

I hereby certify that the attached Appeal Brief is being deposited in triplicate with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to Box AF, Assistant Commissioner of Patents, Washington, D.C. 20231, on this 11th day of April, 2003.



Laura Combs

CLAIM APPENDIX

4. A brake shoe assembly comprising:

a brake spider;

a mounting member supported on said brake spider and including an arcuate surface for supporting a brake lining;

an anchor pin pivotally mounting one end of said mounting member to said brake spider, said anchor pin including a cylindrical body with a pair of pin ends extending in opposite directions from said body to define a pivot axis; and

a single retainer clip attached solely to said mounting member and cooperating with both of said pin ends to maintain proper shoe orientation, said retainer clip including a base portion with a connector portion and a pair of legs extending outwardly from opposite ends of said base portion to support said anchor pin with said pin ends being supported by said legs wherein said retainer clip, said anchor pin, and said mounting member are all rotated about said pivot axis during brake actuation.

6. A brake shoe assembly comprising:

a brake spider;

a mounting member supported on said brake spider and including a backing plate with an arcuate surface for supporting a brake lining and a pair of spaced apart webbed flanges;

an anchor pin pivotally mounting one end of said mounting member to said brake spider, said anchor pin including a cylindrical body with a pair of pin ends extending in opposite directions from said body to define a pivot axis wherein said spaced apart webbed flanges extend inwardly from said base plate toward said pivot axis; and

a retainer clip attached to said mounting member and cooperating with said anchor pin to maintain proper shoe orientation wherein said retainer clip includes a base portion with a connector portion and a pair of legs extending outwardly from opposite ends of said base portion to support said pin ends of said anchor pin and wherein said connector portion includes a resiliently biased tab with at least one transversely extending grip for engaging said backing plate between said flanges to retain said clip on said mounting member.

9. A cam brake assembly comprising:

a first brake shoe including a first backing plate for supporting a first brake lining;

a second brake shoe including a second backing plate for supporting a second brake lining wherein said second brake lining faces an opposite direction from said first brake lining;

a brake spider having a first mounting portion for attachment to said first brake shoe and a second mounting portion for attachment to said second brake shoe;

a first anchor pin pivotally attaching one end of said first brake shoe to said first mounting portion to define a first pivot axis, said first anchor pin including a first cylindrical body with a first pair of pin ends extending in opposite directions from said first cylindrical body;

a second anchor pin pivotally attaching one end of said second brake shoe to said second mounting portion to define a second pivot axis, said second anchor pin including a second cylindrical body with a second pair of pin ends extending in opposite directions from said second cylindrical body;

an actuator for pivoting opposite ends of said first and second brake shoes about said first and second pivot axes, respectively, during a brake actuation;

a first retainer clip attached to said first brake shoe having a first pair of legs interconnected by a first base portion with said first pair of legs cooperating with said first pair of pin ends to maintain proper contact and orientation between said first anchor pin and said first brake shoe; and

a second retainer clip attached to said second brake shoe having a second pair of legs interconnected by a second base portion with said second pair of legs cooperating with second pair of pin ends to maintain proper contact and orientation between said second anchor pin and said second brake shoe.

10. An assembly according to claim 9 wherein said first retainer clip is attached to said first backing plate and said second retainer clip is attached to said second backing plate.

11. An assembly according to claim 9 wherein each of said first and second backing plates includes a pair of spaced apart transversely extending webbed flanges defining an engagement surface, said engagement surface of said first backing plate contacting said first anchor pin and said engagement surface of said second backing plate contacting said second anchor pin.

12. An assembly according to claim 11 wherein said first and second retainer clips engage said webbed flanges of said first and second backing plates.

13. An assembly according to claim 11 wherein each of said anchor pins include a cylindrical body and a pair of pin ends of smaller diameter than said body extending outwardly from opposing ends of said body and wherein an exterior surface of said body contacts said engagement surfaces of said webbed flanges.

14. An assembly according to claim 13 wherein each of said retainer clips include a base plate with a pair of hooked legs for supporting said pin ends.

15. An assembly according to claim 11 wherein said first retainer clip, said first brake shoe, and said first anchor pin all pivot about said first pivot axis during a brake actuation and said second retainer clip, said second brake shoe, and said second anchor pin all pivot about said second pivot axis during a brake actuation.

16. A cam brake assembly comprising:

a first brake shoe including a first backing plate for supporting a first brake lining;

a second brake shoe including a second backing plate for supporting a second brake lining wherein said second brake lining faces an opposite direction from said first brake lining;

a brake spider having a first mounting portion for attachment to said first brake shoe and a second mounting portion for attachment to said second brake shoe;

a first anchor pin pivotally attaching one end of said first brake shoe to said first mounting portion to define a first pivot axis;

a second anchor pin pivotally attaching one end of said second brake shoe to said second mounting portion to define a second pivot axis;

an actuator for pivoting opposite ends of said first and second brake shoes about said first and second pivot axes, respectively, during a brake actuation;

a first retainer clip attached to said first brake shoe for cooperation with said first anchor pin to maintain proper contact and orientation between said first anchor pin and said first brake shoe; and

a second retainer clip attached to said second brake shoe for cooperation with said second anchor pin to maintain proper contract and orientation between said second anchor pin and said

second brake shoe wherein each of said first and second retainer clips includes a connector portion having a resilient tab with at least one grip for engaging a portion of said brake shoes to retain said clips to said shoes.

17. A brake shoe assembly comprising:

a brake spider;

a mounting member supported on said brake spider and including an arcuate surface for supporting a brake lining;

an anchor pin pivotally mounting one end of said mounting member to said brake, said anchor pin including a cylindrical body with a pair of pin ends extending in opposite directions from said body ; and

a single retainer clip attached solely to said mounting member and cooperating with both of said pin ends to maintain proper shoe orientation wherein said retainer clip, said anchor pin, and said mounting member are all pivotable about a common pivot axis to maintain proper shoe orientation independently from a second brake shoe assembly.

18. An assembly according to claim 17 wherein said retainer clip comprises a base portion integrally formed with a pair of transversely extending legs positioned on opposite sides of said base portion for engagement with said pin ends.

19. An assembly according to claim 18 wherein said cylindrical body has a greater diameter than said pin ends.

20. An assembly according to claim 9 wherein said first retainer clip is a single piece retainer clip with said first pair of legs being integrally formed as one piece with said first base portion and wherein said second retainer clip is a single piece retainer clip with said second pair of legs being integrally formed as one piece with said second base portion.

21. An assembly according to claim 9 wherein said first base portion extends parallel to said first cylindrical body between said first pair of pin ends and wherein said second base portion extends parallel to said second cylindrical body between said second pair of pin ends.